

## ABSTRACT:

The invention relates to a scanning device (1) for scanning a disc-shaped information carrier (11), such as a CD or DVD. The scanning device comprises a table (3) for the information carrier, which is rotatable about an axis of rotation (7). The scanning device further comprises a scanning unit (13) and a linear motor (29) by means of which the scanning unit can be displaced with respect to the table in a radial direction (X, X'). Said linear motor comprises a first part (39) and a second part (41) which are guided with respect to each other in said radial direction by means of a straight guide (27). Said first part comprises pairs of magnets (47, 49) having opposite directions of magnetization (M, M') which extend substantially perpendicularly to the straight guide. Said second part comprises an electric coil system (51) having winding portions (65, 67) extending substantially perpendicularly to said directions of magnetization and to said straight guide. The linear motor is further provided with a control unit (77) for controlling an electric current ( $i_1, i_2, i_3$ ) in said coil system.

According to the invention, the control unit (77) turns on and controls an electric current ( $i_1, i_2, i_3$ ) in at least one of said winding portions (65, 67) if said winding portion is present in a magnetic transition region between two adjacent magnets (47, 49) having opposite directions of magnetization (M, M'). As a result of the interaction between the current in said winding portion and the magnetic field in said transition region, a Lorentz force ( $F_Z$ ) on said winding portion is generated, which is directed substantially perpendicularly to the straight guide (27). Said Lorentz force ( $F_Z$ ) is used to fix one of the six degrees of freedom of the second part (41) with respect to the first part (39). Since the linear degree of freedom in the radial direction (X, X') is fixed in a usual manner by a Lorentz force ( $F_X$ ) of the linear motor (29), which is directed parallel to the radial direction, two degrees of freedom of the second part are fixed by the linear motor, so that only four degrees of freedom have to be fixed by the straight guide.

In a particular embodiment, the straight guide (27) comprises a single guide shaft (73), and the Lorentz force ( $F_Z$ ) is used to fix a rotational degree of freedom of the second part (41) about said shaft (73).

(Fig. 2)